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FURTHER NOTES ON CLADONIAS. XIII. *Cladonia cristatella* and *Cladonia coccifera*.

BRUCE FINK.

In the two species considered in this second paper on the scarlet-fruited Cladonias, we seem to be perhaps nearer certain of the brown-fruited Cladonias than we were in the three species considered in the last paper of the series. In confirmation of this view, it may be stated that both *Cladonia cristatella* and *Cladonia coccifera* have pale-fruited varieties, which may easily be confused with such species as *Cladonia mitrula*, *Cladonia botrytes*, *Cladonia pyxidata* and *Cladonia carneola*. Even so good a lichenist as Nylander seems to have confused Tuckerman's *Cladonia cristatella ochrocarpia* with specimens of some pale-fruited American Cladonia, constructing therefrom his species, *Cladonia substraminea*, with two varieties, one from North America and one from South America. This illustrates the dangers of making species from a few specimens submitted, Tuckerman knowing well that his plants grew with the ordinary scarlet-fruited plants in the White Mountains. Again, the resemblance of certain forms of *Cladonia pityrea* to *Cladonia cristatella* was noted in a former paper of this series, and the former species rarely shows a tendency toward scarlet-fruited conditions as in some specimens collected by the writer in Iowa and determined by Dr. Wainio.

The resemblance of a pale-fruited variety of *Cladonia coccifera* to *Cladonia pyxidata* and *Cladonia carneola* is noted below, and it need only be added here that the variety of *Cladonia coccifera* often shows fruits variegated with yellow and scarlet.

The two species considered in the present paper are somewhat closely related and have been confused. But *Cladonia incrassata* Flk. is an intermediate species, sometimes scyphiform and sometimes without cups, and our constantly scyphiform *Cladonia coccifera* need not be confused with the cupless *Cladonia cristatella*.

The specimens used to illustrate this paper were both collected in Minnesota by the writer.

CLADONIA CRISTATELLA Tuck. Syn. Lich. New Eng. 55. 1848. Primary thallus usually persistent, composed of incised or crenate, small squamules, which are 2-3 mm. long and wide, commonly flat but sometimes involute, scattered or clustered, sea-green or straw-yellow above and whitish below, sometimes sorediate above. Podetia arising from the surface of the squamules; usually of moderate length, 4-35 mm. long and 0.5-2.5 mm. in diameter; subcylindrical or somewhat enlarged toward the apex, without cups; simple, or more or less fasciculately or digitately branched toward the apex, the

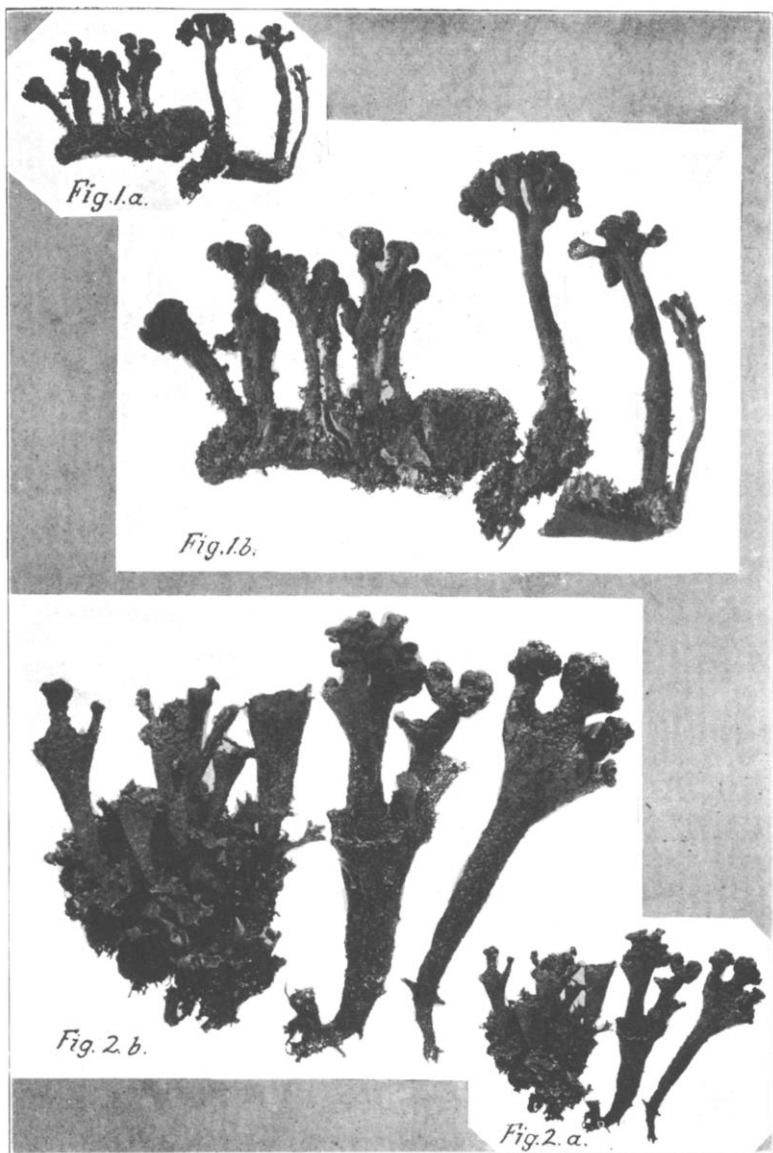


PLATE XI—*Cladonia cristatella*. Fig. 1a Nat. Size, Fig. 1b $\times 2$.
Cladonia coccifera. Fig. 2a Nat. Size, 2b $\times 2$.

branches short and obtuse, and the apex or apices commonly terminated by apothecia; the axils sometimes perforate, clustered or subsolitary; erect and rarely squamulose; cortex continuous or areolate, smooth or roughened; sea-green or straw-yellow. Apothecia medium sized or small, 0.3–3 mm. in diameter, solitary or clustered, convex, immarginate, scarlet. Hypothecium pale or pale yellowish. Hymenium pale reddish above and pale or pale yellowish below. Paraphyses commonly simple, the apices only slightly thickened or colored. Asci cylindrico-clavate. Plate XI. Fig. 1a and 1b.

On dead wood and rarely on earth, especially in rather dry woods. Examined by the writer from Maine (F. L. Harvey), Massachusetts (Clara E. Cummings), New York (E. A. Burt and Carolyn W. Harris), Long Island (H. von Schrenk), Ohio (E. E. Bogue, M. Foltz and Bruce Fink), Missouri (C. H. Demetrio and Colton Russell), South Carolina (H. A. Green), Illinois (G. P. Clinton and Bruce Fink), North Carolina (Colton Russell), Wisconsin, Iowa and Minnesota (Bruce Fink), Ontario (J. Macoun), Newfoundland (A. C. Waghorne, and labeled *Cladonia coccifera*), Tennessee (W. W. Calkins and referred to *Cladonia pulchella*). H. Willey records from Massachusetts and Illinois, W. W. Calkins from Illinois, J. W. Eckfeldt and W. W. Calkins from Florida, Charles Mohr from Alabama and C. H. Peck from New York. Wainio's distribution adds Virginia, New Jersey, Indiana, Georgia and Texas. J. Macoun finds the plant widely distributed in British America, but neither he, Dr. H. E. Hasse, nor any other collector seems to have found it along the Pacific coast. Otherwise, widely distributed in North America. A distinctly North American lichen.

CLADONIA CRISTATELLA RAMOSA Tuck. Obs. North Amer. Lich. 395. 1862. Podetia spreading, branched below and dichotomously much-divided above.

On sterile earth in the White Mountains, and also in Illinois according to H. Willey.

CLADONIA CRISTATELLA VESTITA Tuck. Syn. North Amer. Lich. 255. 1882. Podetia densely squamulose, and often much like *Cladonia pulchella*.

From Massachusetts and New Jersey. Also a specimen sent Dr. Wainio, collected by the writer at Tower, Minnesota, was placed here.

CLADONIA CRISTATELLA PALUDICOLA Tuck. Syn. North Amer. Lich. 255. 1882. Podetia very short and the apothecia almost sessile. The squamules of the primary thallus squamulose

In Cypress and other swamps, indefinitely reported by Tuckerman. The writer has referred here a specimen collected on a log at Mankato, Minnesota. But the squamules are scarcely sorediate, and the determination is doubtful. H. Willey records for Massachusetts.

CLADONIA CRISTATELLA OCHROCARPIA Tuck. Syn. North Amer. Lich. 255. 1882. Apothecia sometimes yellow. Tuckerman first called this *Cladonia floerkeana ochrocarpia* Tuck. Lich. Amer. Excic. no. 133. 1854. *Cladonia substraminea* Nyl. Syn. Lich. 204. 1860, seems to be the same in part.

Reported as frequent on sterile soil in the White Mountains, where it is frequent and mixed with the ordinary form of the species. Also said to occur in New York and Massachusetts, H. Willey recording from latter State.

CLADONIA COCCIFERA (L.) Willd. Fl. Berol. Prod. 361. 1787. Primary thallus usually persistent, composed of irregularly or flabellately incised, crenate or lobate, small or larger squamules, which are 1-4 mm. long and 1-3 mm. wide (foreign measurements more than twice as large): flat or somewhat involute, the lower side often more or less distinctly nervose; clustered, or scattered, light to reddish sea-green above and white below or yellowish toward the base, the base and the nerves yellow or red; rarely sorediate above and at the margins. Podetia arising from the surface of the primary thallus, 4-50 mm. long and 1-4 mm. in diameter at the base, cup-bearing, cylindrical or turbinate, erect, corticate, the cortex subcontinuous toward the base and areolate-verrucose toward the top; sea-green, frequently yellowish or reddish tinged; the decorticate areas between the areoles are frequently white or yellowish; rarely more or less squamulose. Cups gradually or abruptly dilated, sometimes becoming oblique, subentire, dentate, radiate or proliferate, one to four proliferations from cup-bearing cups or apothecia, proliferations arising from the margins of the cups or rarely from within, the lower rank 4-30 mm. long, the upper one or more formed by proliferation usually shorter. Apothecia varying much in size, 1-8 mm. in diameter in ours (and frequently twice as large in foreign specimens); clustered or solitary, at the dilate apices of the proliferations or sessile on the margins of the cups: convex or depressed convex; thinly margined or more commonly immarginate, scarlet in ours. Hypothecium pale. Hymenium pale red above and pale below. Paraphyses usually simple, somewhat enlarged at the apex. Asci cylindrico-clavate. Plate XI. Fig. 2a and 2b.

On earth and on humus over rocks. Examined by the writer from New Hampshire (Clara E. Cummings, G. K. Merrill and R. H. Howe, Jr.), Massachusetts (Clara E. Cummings), Connecticut (H. A. Green), New York (Carolyn W. Harris), Iowa, Minnesota, Washington, British Columbia, Alberta (Bruce Fink), Montana (R. S. Williams), Ontario (J. Macoun), Alaska (Wm. Trelease). Chas. Mohr records from Alabama, C. H. Peck from New York, H. Willey from Massachusetts and J. Macoun from many localities in British America. Dr. Wainio's distribution adds only Guatemala. A large part of specimens are recorded under the synonym, *Cladonia cornucopioides* (L.) Fr. These forms fall mainly at least under *Cladonia coccifera stematina* (Ach.) Wainio Mon. Clad. Univ. 1: 153. 1887, which is the normal form and which we prefer to let stand with the species. Widely distributed in northern United States, British America and southward in the mountains. Tuckerman records from Oregon by Hall, otherwise the collections of the writer from Washington seem to be the only ones from the west coast, within the United States. Known in all the grand divisions except Africa.

CLADONIA COCCIFERA PLEUROTA (Flk.) Schear. Lich. Helv. Spic. 25, 1823. Podetia corticate below and more or less sorediate above. Squamules usually sorediate below and along the margins.

Examined by the writer from New England (Clara E. Cummings), New Hampshire (R. H. Howe, Jr.), Massachusetts (H. Willey), Iowa, Minnesota and British Columbia (Bruce Fink), Nova Scotia and Newfoundland (A. C.

Waghorne), Alaska (Wm. Trelease). Recorded from Montana by Carolyn W. Harris. Dr. Wainio's distribution adds Greenland, North Carolina and California. Thus the variety seems to be as widely distributed in North America as the species, but it is much less common in most localities. Its foreign distribution is also the same as the species.

CLADONIA COCCIFERA OCHROCARPIA Flk. in Sommerf. Suppl. Fl. Lapp. 128. 1826. Apothecia yellow; the podetia without soredia.

Recorded by H. Willey from Massachusetts. Found also in Europe.

The plant is little known and is easily confused with *Cladonia pyxidata* on account of its yellow apothecia. Also easily mistaken for *Cladonia carneola*, but this always has podetia sorediate toward the top. The plant may be distinguished from *Cladonia pyxidata* by a careful comparison of the primary thallus. Doubtless to be found elsewhere in North America

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NOTES ON NOMENCLATURE VIII.

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Parts 227 and 228 of Engler and Prantl, Die natürlichen Pflanzenfamilien by Brotherus were received in April, 1907. They include the *Lembo-phyllaceae*, *Entodontaceae*, *Fabroniaceae*, *Pilotrichaceae*, *Nematoceae* and *Hookeriaceae*. Thirty-five genera known to occur in North America, Central America and the West Indies, with one hundred and ninety-nine species, are listed

Isothecium Brid. includes four North American species following Cardot and Grout. *Orthothecium* Br. & Sch., three species. *Entodon*, twenty-seven species, eight North American. *Platygyrium* Br. & Sch., one species, *P. repens*. *Pylaisia* Br. & Sch., six species, four North American. *Tripterocladium* (C. M.) Kindb. with three species. *Pterygynandrum* Hedw. with two species. *Stereophyllum* Mitt. with nine species, only one North American. *S. Donnellii* (Aust.) R. & C. is omitted, probably by mistake.

Austinia C. M., dedicated to Coe Finch Austin, is included with one Cuban species. *Fabronia* Raddi includes nine species of which four are North American. *Anacamptodon* Brid., two species, one West Indian. *Schwetschkea* C. Mull., one species, *S. denticulata* (Sull.) Card. *Helicodontium* Schwaegr. 1824. (*Myrinia* Schimp. 1866) to include *H. Dieckii* (Ren. & Card.) Broth. from Oregon and three other American species. *Clasmatodon* Hook. & Wils. with one species. *C. parvulus* (Hpe.) Sull. *Habrodon* Schimp. with *H. perpusillus* (De Not.) Lindb. (*H. Notarisii* Schimp.

The greatest number of changes occur in the *Hookeriaceae*, which are split up into thirteen genera, only three of which contain North American species: *Cyclodictyon varians* (Sull.) Broth. replaces *H. varians* Sull. *Callicostella cruceana* (Dub.) Jaeg. replaces *H. cruceana* Duby. *Hookeria* Sm. is restricted to five species, and *Pterygophyllum lucens* is replaced by *H. lucens* (L.) Sm., which is congeneric with *H. Sullivantii* from North America